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Planning for the Physical Inventory

By
STANLEY G. H. FITCH,
Patterson, Teele & Dennis,
Boston, Mass.

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Editorial Department Note

At the close of the fiscal period, the attention of the business manager and of the accountant is centered largely on the subject of inventory. While inventory taking is a periodic activity, the related problem, control of merchandise stocks, is of perennial concern. The more closely stocks are watched and controlled throughout the year, the less hazardous and important is the physical inventory. Every system of control must, however, provide a method of periodic checking of book stocks against physical stocks. The method of the physical inventory, whether taken in its entirety once or twice a year or piece-meal at interim periods, will always be the backbone and chief reliance of all summary statements of operating results. Accordingly the problems connected with the physical inventory will always be of interest and importance. From the standpoint of the work involved in taking the physical inventory, getting ready for taking it is almost, if not quite, as important as actually taking it. We are, therefore glad to be able to present at this time a paper dealing with this problem.

The author of this paper is Stanley G. H. Fitch, certified public accountant of New York, New Jersey and Massachusetts. Mr. Fitch is a member of the American Institute of Accountants; a member and past president of the Massachusetts Society of Certified Public Accountants; and a member of the National Association of Cost Accountants. He was graduated from the Massachusetts Institute of Technology as a chemical engineer after which he engaged for nine years in engineering practice and as auditor and treasurer of manufacturing corporations. He then joined the staff of Patterson, Teele & Dennis, Cost Accountants and Auditors, in 1909 and has been a member of the firm since 1919. He is author of numerous articles on accounting subjects and is a special lecturer and instructor in accounting at the College of Business Administration of Boston University.

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PLANNING FOR THE PHYSICAL INVENTORY

Because of the extra and overtime work involved and the necessary interruption of regular factory and office routine, inventories have always been regarded with mingled feelings of dread and dismay by the bookkeeping department, the stores keepers, the factory accountants, and others concerned in the work of taking, pricing, and figuring. With the more general use of perpetual inventory records, the disruption in business routine arising from annual or periodical physical inventories has to some extent been relieved. However, at some time or other, in practically every industrial and mercantile business, an actual count of stock must be made. Consequently, it behooves us as interested parties to consider carefully whatever steps may be taken to facilitate inventory taking, thereby saving time, eliminating interruptions in business routine, and enhancing the value of the inventory record by virtue of speed and accuracy in completing the job.

In theory the problem of taking inventory may be regarded

as the same in every business. Practically every business has a problem of its own, arising from the nature of the merchandise or materials handled. It is difficult, therefore, to treat the subject before us in general terms. Accordingly, as a typical case, a large machinery manufacturing plant, operating its own foundry, wherein many of the ordinary inventory problems are met, has been selected as a basis for discussion. Reference will be made also to other industries, such as, soap manufacturing, tanning, shoe manufacturing, cotton textiles, and the department store, all of which present questions peculiar to their own inventory taking.

This paper will not take up a discussion of the problem of inventory pricing. Here it is intended to outline the procedure for obtaining an accurate physical count or measurement which may be used for subsequent valuation.

Preparing for the Inventory

When to Take Inventory. Annual inventories are generally taken as of the close of a fiscal year. Similar inventories are frequently taken semi-annually, quarterly, or monthly. The annual inventory, however, is usually more thorough and accurate than other periodical inventories because upon it rests in large measure the accuracy of the annual profit and loss statement and the balance sheet. It is an axiom that the close of a fiscal year should coincide with the completion of the business cycle. At such time stocks should be at the lowest levels consistent with sound business judgment, so that the task of taking inventory may be reduced to the minimum.

Avoidance of Plant Shut-Downs. In order to obtain an accurate count of stock, it is sometimes regarded as necessary to shut down the plant for a period of from a day to a week or more. Except in the case of a seasonal business in which an annual shut-down results from lack of orders, such a procedure should be avoided, if possible, because of the interruption in output and the dissatisfaction felt by the employees at an enforced lay-off. Frequently a Sunday and a holiday can be utilized to eliminate or minimize a shut-down.

If it is essential to complete a large inventory in a limited time, a considerable number of people must be assigned for that purpose. It is, however, often difficult to find enough people acquainted with the nature and location of the stock to do an intelligent job. Accordingly, if the time factor may be disregarded, the stock-taking period may conveniently cover from two or three days to a month prior to the actual inventory date, as more fully described later in this paper.

Annual Physical-Inventory Facilitated by Perpetual Inventory Records. Where perpetual inventory records are in use it is customary throughout the year to make systematic counts of stock on hand and comparisons with inventory balances as to quantities, followed by necessary adjustments for errors found. The proof of total values shown by the perpetual inventory records with the

inventory controlling accounts, however, is usually made only at the close of the fiscal year when a complete physical inventory is taken. Further checks upon perpetual inventory balances are made when the various materials or lots become exhausted or reach their stock minimum or order points. Consequently, the annual inventory under such conditions becomes a repetition of routine procedure; unusual discrepancies in stock should be rare; and the inventory should approach the goal of absolute accuracy always sought, but practically never reached.

Store Room House Cleaning. The orderly arrangement of materials and supplies in the storeroom, warehouse, or yard will greatly facilitate the inventory taking. The inevitable accumulation of scrap or waste should, if possible, be sold except in cases where such material is to be put into process again, as in the case of cast iron scrap which should be collected from the machine shop and delivered to the iron foundry where it comprises one of the items of raw material. Parts known to be obsolete or unsalable should be scrapped and removed from the storeroom for final disposition.

Boxes, kegs, bags, bales, or other original packages should be stacked in rows or piles so that by counting the number of units in the width, depth and height of the pile the total can be obtained by quick multiplication, thus avoiding a laborious count of every package.

Materials received shortly before the actual counting of stock begins should be held in a separate part of the receiving room and should not be mingled with the materials in the storeroom. Such materials should be listed separately for inclusion in the inventory.

Inventories of bulk materials stored out of doors, such as coal, coke, sand, and pig and scrap iron, are based on surveys and measurements and the quantities so ascertained should be compared with perpetual inventory balances. If such materials are stored so that the piles can be identified with specific carloads the preliminary work can include the complete checking of the quantities, subject only to adjustments to actual inventory date. The inventory of lumber can be quickly taken if the lumber is piled in tiers and a tally kept of the board feet in each tier, and the tiers numbered or otherwise marked for identification and record on the perpetual inventory. It is then necessary only to check off the unbroken tiers and to tally the lumber in the partly used tiers. If conditions permit, each carload should be piled separately and identified in the perpetual inventory.

Other time-saving short cuts for stock taking might be cited, but the foregoing are sufficient to emphasize the importance of orderly arrangement as a preliminary to the actual counting, weighing, or measuring of the materials.

Schedules and Instructions for Physical Inventory. The custody and physical control of inventories is usually vested in the chief operating official (e.g., Works Manager or Superintendent) with a General Storekeeper directly in charge. The accounting

control is exercised by the chief accounting official (e.g., General Auditor or Comptroller). Obviously, plans for inventory taking should be worked out by those officials in co-operation as they both have a stake in proving the correctness of the inventory total. A plan of the plant should be made, if not already available, showing the location of every department where inventory is to be taken. For this purpose an elaborate plan is not needed; a rough diagram will do for practical purposes. A schedule should then be prepared showing the departments, the nature and extent of the stock in each (e.g., in the storeroom the approximate number of items carried in stock), the number of people to be assigned to take each departmental inventory, the estimated number of days allowed for the job, and the date on which the actual counting in each department is to begin. It may be remarked in passing that a record should be kept of the time required for inventorying each department and a later comparison made with the scheduled estimates. Discrepancies might indicate excessive time consumed due to poor arrangement of stores or work in process, which should be reported for improvement before the next inventory date.

Supplementing and accompanying the inventory schedule should be found inventory instructions from the General Auditor or the Works Manager, embodying general directions governing the use of inventory sheets and inventory tags or cards, and specific directions for inventorying and reporting upon certain materials which require special consideration, such as obsolete or slow-moving materials, repair parts carried for discontinued lines, excessive stocks of materials, materials held on consignment, etc. The inventory instructions may properly invite recommendations for changes in maximum and minimum stores quantities, based on experience as recorded on the bin cards or perpetual inventory records or on changes in design of product. In other words, inventory time should be availed of to study and improve methods of keeping, handling, and accounting for materials, supplies, work in process, and finished product; and this can be readily done without waste or duplication of effort, if advance notice is given that information along that line will be wanted after the actual taking and listing of the inventory has been completed.

Forms for Inventory Tags and Inventory Sheets Prepared in Advance. Inventory tags or cards, serially numbered, should be prepared in advance as far as possible for all items in the inventory, showing bin number, piece number, if any, and description of material or part. If the actual count is to be made in advance of the inventory date, provision should be made on the tag for recording the quantity counted and subsequent receipts and deliveries to inventory date. All tags issued should be charged to the respective departments and any unused tags should be returned.

Taking the Inventory

The actual counting, weighing, or measuring of the materials and supplies, work in progress, and finished product

on hand in the various storerooms and manufacturing departments should be started according to the inventory schedule. As the work progresses the quantities should be recorded on the inventory tags which should be attached to each bin or lot. Each section of the storeroom, shop, or warehouse should be carefully surveyed before leaving the work to make sure that every item or lot has been properly tagged.

Inventory sheets should be prepared in advance for all regular stock material, showing location, bin number, piece number, and brief description, so that when the inventory is listed only the quantities remain to be recorded. The listing of the inventory is usually done by stock-takers working in pairs, which may comprise one man from the stores department and one from the accounting department. The latter will usually test the quantities as the listing proceeds, and lift the tags as he calls the quantities to his partner who records them on the inventory sheets previously prepared. The tags subsequently should be compared with the perpetual inventory records and any differences in the balances should be promptly investigated and adjusted. Such a check will disclose errors in physical count or discrepancies in the perpetual inventory record arising from unrecorded receipts and deliveries or careless clerical work. In case no tests of the count are required the listing can proceed more rapidly. In fact, it may be found convenient to lift the tags wthout listing where the material is located and to transfer that work to the office. Both tags and inventory sheets should be planned to facilitate tabulation of inventory items according to the three basic classifications, i.e., raw materials, work in process, and finished product, with further sub-division according to established accounting control.

If the conditions under which the inventory is to be taken require a complete check, either by the company's general auditor or by an independent firm of accountants or engineers, the inventory tags should carry a coupon numbered like the tag on which the description and quantity should also be recorded. After completion of the count and the testing thereof, the coupons should be lifted by the representative of the auditor while the tags should be used by the stores department as already described for writing up the inventory. After pricing and figuring, the inventory sheets should be turned over to the auditors for comparison with the tag stubs as a precaution against the inclusion of quantities other than those shown by actual count.

Work in Process. The inventory of work in process presents some difficulties not encountered with raw materials and finished product. If the plant is to be shut down for inventory, it will be possible to complete many, if not all, of the small parts on orders in process and transfer them to the assembly floors or store room. Otherwise, many hundreds or thousands of unfinished machine parts will have to be counted and listed in a partly finished condition, with an accurate description of the extent of the work thereon. Where the manufacturing operations are effectively con-

trolled by production orders, the orders in process should be listed by the cost department and used as a basis for the identification and checking of the work in process.

In the average foundry the work in process will give little trouble. After the day's heat has been poured there will remain little in process except in the case of moulds for very large castings requiring more than one day for completion. These may be inventoried as work in process on the basis of actual moulding labor and overhead expense applicable thereto. Castings in the cleaning room may be taken as finished castings with an allowance for cost of cleaning.

As already stated, the metal-working foundry and industries were selected as presenting many of the typical inventory problems found in various industries. A few illustrations from other industries, such as soap manufacturing, tanning, shoe manufacturing, textile manufacturing, and the department store, will now be given, as they present further specific inventory questions which should be considered.

Specific Illustrations

Soap Manufacturing. In soap manufacturing, which may be taken as typical of the group of chemical industries, bulk raw materials comprising fats and oils are stored in large tanks. To inventory such materials it is necessary only to record the tank levels and to translate the figures into quantities by the use of constants.

Soap in process is found chiefly in kettles, storage tanks and mixers. In order to obtain results approaching uniformity, it is necessary to take the contents of soap kettles after boiling and settling for a stated time. At the same time a sample of the kettle stock is drawn and submitted to the laboratory for analysis as to soap content and the percentage reported is used in computing the quantity of soap in the kettle.

As it is not practicable to inventory all kettles at the same time, care must be used in taking the soap in the storage tanks and mixers not to duplicate any soap already inventoried as in process in the kettles. This can usually be accomplished by following the accounts for the respective kettles stocked.

Tanning—Upper Leather. At the time of purchase hides are identified by lot numbers which are recorded in an inventory record or lot book showing the weights and number of hides billed. Hides are received in bundles, two or three per bundle, but the bundles are not usually broken until the hides are put into process. At that time they are counted and checked with the number shown by the lot book. Up to that point the units are weight and quantity. The *hides* are then cut down the back and become *sides* and the lot number is stamped on each side. The sides are then put into soak and during the subsequent processes of unhairing, splitting, tanning, etc., the *side* remains the unit of count. When

the tanning processes are completed the unit of measurement for the leather becomes the square foot.

If the inventory is to be taken without shutting down, the sides in process present a difficult problem. The soaking process takes from two days in the paddle wheels—sulphite process—to six days in the pits—lime process—and obviously the sides could not well be withdrawn for counting and put back in the pits. All lots put into soak to remain there over the inventory date should be counted and recorded for inventory and any sides taken out of soak should be counted and checked for inventory at that point. In inventorying sides in subsequent stages of the tanning process, care should be taken to see that no duplication results from counting a second time sides that have already been taken and included in the inventory earlier in the tanning process.

The tanned sides, i. e. leather, will be found stacked on trucks, horses and racks. Wherever possible the leather should be sorted and piled by lot numbers as that preliminary work will greatly facilitate the counting and listing. Numerous lots are put through together, however, so that as a practical matter the sorting by lot numbers may not be possible. Furthermore, some difficulty in identifying the skins always arises from loss of lot numbers in buffing, tacking and staking, and there is an actual loss of sides in liming, etc., so that it rarely is possible to tie up the inventory count with the balances called for by the lot book. With allowance for losses, gained by experience, variations should not be large.

Shoe Manufacturing. Shoe factory inventories are usually taken at the end of a seasonal run, either spring or fall, or both, when it may be convenient to shut down. Under such conditions there will be no work in process as all orders will have been completed prior to shutting down. Raw materials, supplies, and finished goods can be readily taken on the usual lines of procedure. When a shut-down is undesirable, owing to manufacturing activity, an accurate inventory can be taken provided an adequate force is used and plans laid in advance for avoidance of delay in the work. In each of the manufacturing departments, viz., cutting, stitching, lasting, making, finishing, and packing a day or two before inventory date, all materials, findings and supplies should be arranged conveniently for quick counting, the quantities listed on inventory slips and any changes noted up to the close of business on the inventory date. Shoes in process should be listed in each department according to tag number with a description of the stage of manufacture reached, as this provides a basis for subsequent pricing according to cost sheets for the respective styles of shoes.

Under conditions where a partial shut-down is permissible, a third method of inventory is sometimes used. After the cutting room has completed the work on the last day-sheet for the old run, it will shut down for a day or two. The stitching room will follow suit after completing the work on all the old run orders received from the cutting room. This procedure will be followed in successive departments until, say, two to three weeks after the

cutting room shut-down, all old run shoes will have been completed and either inventoried as finished goods or accounted for as sales as of the close of the old run. In the meantime, the cutting room will have started up again and the new run goods will be coming through the factory, but behind the last of the old run. In order to make a correct accounting for inventory under this method, all labor and expense accrued against the old run goods subsequent to the closing date must be taken up as a liability as of that date and must be accounted for separately from similar expenditures on the new run shoes.

Cotton Mill. The inventory of raw materials and finished product in a textile mill presents no unusual features. With respect to work in process, however, it is advisable, whenever possible, to close down the mill at inventory time, as it is very difficult to take an accurate process inventory while the materials are constantly moving from one department to another.

Employees charged with the responsibility of taking the inventory should be instructed in advance to leave the materials in their respective departments in as orderly a manner as possible at the time of closing for inventory purposes and should be cautioned against moving material from one department to another after the work of taking the inventory has started and remains in progress. Piece goods in finished goods department should be arranged in orderly fashion on tables and racks.

Departmental tests to establish unit weights may be made in advance of the inventory taking, as, for example, in the card room the average weight of laps and of sliver in cans; in the speeding department the average weight of roving on bobbins; in the spinning department, the average weight of yarn on bobbins; in the spooling department, the average weight of yarn on spools. Such data, ascertained in advance, will facilitate the completion of the inventory when the actual count and weight of materials in process is taken.

In the spinning department, in taking the actual count of bobbins in creels, the bobbin capacity of the spinning frames is used, the bobbins being regarded as half full; and similarly for yarn on bobbins, the spindle capacity of the frames is used, the bobbins again being regarded as half full.

On the looms in the weave room will be found both process material and cloth, i. e., filling yarn and warp beams on one side and cloth on the other. The filling at the looms may be ascertained from the number of looms in operation, the average number of bobbins per loom and the weight of filling yarn per bobbin.

When warp beams are set in looms they are considered as being in the weaving process. A beam consists of a certain number of cuts, each cut representing a fixed yardage and having a standard weight per cut which varies with the kind of fabric. Each beam has a ticket attached showing the quality, yardage, cuts, etc. A strip of tickets for the operator is attached to the loom, each ticket representing one cut of material. As each cut is taken

from the loom in the form of cloth a ticket is torn from the strip and sent to the weave room office by the operator. The clerk in the weave room office posts it up against the particular loom on the weave room sheets and deducts it from the original number of cuts charged against the loom when the warp was put on. These sheets will show at all times the number of cuts in process. However, the cuts in process are not all in warp, as almost invariably each loom will have some cloth on it (i. e., it has passed the weaving operation); and, inasmuch as the cloth has both warp and yarn filler, it has to be deducted from the warp cuts remaining in process and valued as cloth in looms. An estimate of one third cut per loom is made for cloth. The warp inventory in process should be verified by checking from weavers' tickets—attached to looms—to the weave room sheets in support of the number of cuts shown to be in process by this record.

Through the weave room all quantities are expressed in pounds. Upon leaving the weave room the material is converted into yards.

Department Store. Owing to the variety of merchandise carried by a department store its inventory involves an extraordinary amount of detailed work and presents some problems peculiar to the retail business. The procedure in taking a department store inventory is substantially as follows:

About four weeks before the inventory date detailed written instructions as to the methods to be employed in counting, weighing, or measuring merchandise are transmitted to the heads of the various departments which in turn are transmitted to the salespeople. All stock sheets and final inventory sheets are issued from the controller's or auditor's office as needed and charged to the various departments. All have to be accounted for whether used or not.

On receipt of the instructions the work of counting, measuring, and marking commences and continues until completed. This work is done by the salespeople in their own departments during the periods of the day when business is slack and, if necessary, after business hours, so that all of this work is completed at least one day before listing.

During the two or three days prior to the listing of the inventory on the final inventory sheets, the merchandise is listed on serially numbered stock sheets. A stock sheet is placed in each sub-division of every fixture and the contents of the respective subdivisions listed thereon. On the date the inventory is taken, the entries on the stock sheets are transcribed on the final sheets by the salespeople in each department. The items listed on the final inventory sheets are then checked by salespeople from other departments or by non-selling employees. Merchandise in the stock rooms and warehouses is usually listed in the same manner as merchandise on display in the selling departments.

The method of classifying merchandise by age, i. e., by seasons in which purchases were made, depends upon the system in force

in this respect. Some stores assign a letter to each season, and this letter appears on the original tags or tickets attached to the articles in the marking rooms. When the merchandise is listed the season letter appears against each item, so that it is possible to classify the merchandise by seasons and determine the amount of slow-moving stock on hand in each department. Other stores use different colored final inventory sheets for listing the merchandise by age.

Care should be taken in checking furniture and other large articles to see that items sold and charged to customers, but undelivered, are not included in the inventory. The sold items are usually tagged with a special colored tag and can be readily identified, but items are also sold from floor samples and delivered from the reserve stock in the warehouse, and this is where errors may occur.

With regard to departments rented to outsiders no action need be taken in respect to the inventory, as the store is not interested.

It is a policy of department stores nowadays to send electrical appliances, and other merchandise, to customers' homes on approval. Such articles remain the property of the store and should be included in the inventory, and can be verified by reference to the memo sales slips in the controller's office.

For some time before the inventory date, all merchandise received, except special orders and merchandise for special sales, etc., remains in the receiving room or marking rooms and is not considered as part of the inventory; nor is the liability therefor included as accounts payable. This is done primarily to enable the various departments, store and office, to bring all work up to date, and also to keep the inventory as low as possible, thereby reducing clerical work thereon.

Department stores as a general rule now value their merchandise inventories by the "retail method," a method which is recognized as sound and conservative for balance sheet purposes and is accepted by the United States Treasury Department as a basis for determining taxable income. It is therefore important to note that simultaneously with the listing of the articles they must be valued at the current retail price in order that a comparison may be made of physical and book inventories by departments to determine overages and shortages in merchandise.

In the time allotted for the presentation of this important subject, "Planning for the Physical Inventory," it is manifestly impossible to cover every possible case. It is hoped, however, that what has been said may provide a basis for discussion of the cases chosen as typical or of others in which any one may be particularly interested.